

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 28 FEB 2006

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Applicant's or agent's file reference A4-340PCT	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/US2004/041677	International filing date (day/month/year) 10.12.2004	Priority date (day/month/year) 11.12.2003	
International Patent Classification (IPC) or national classification and IPC F28F1/12, H01L23/467			
Applicant MOLEX INCORPORATED et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a.  *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
    - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b.  *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

Date of submission of the demand 25.07.2005	Date of completion of this report 01.03.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Van Dooren, M Telephone No. +31 70 340-4097



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US2004/041677

## **Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### **Description, Pages**

1-5 as originally filed

### **Claims, Numbers**

1-19 as amended (together with any statement) under Art. 19 PCT

### **Drawings, Sheets**

1/5-5/5 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	2-7,9-14,16,17
	No: Claims	1,8,15,18,19
Inventive step (IS)	Yes: Claims	
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: US 2003/209342 A1 (HSIN LU CHUN ET AL) 13 November 2003 (2003-11-13)

D2: EP-A-1 081 760 (MOLEX INCORPORATED) 7 March 2001 (2001-03-07)

2. The amendments filed with the International Bureau under Article 19(1) introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 19(2) PCT. The amendments concerned are the following features :

(a) "wherein the column body has a height at least approximately the distance between the top surface and the bottom surface of the radiator"

(b) "wherein the recess is defined by an inner wall that extends continuously in a direction away from the second end".

Although in the embodiment shown in figure 6 the distance between the first and second end of the column body is longer than the length of the through-hole of the radiator, nothing is indicated about the "height" of the column body (this feature is not defined and depends on the orientation of the device). Also, no basis could be found in the original application documents for an inner wall (of the recess) extending continuously in a direction away from the second end, since this feature is broader than the feature of inner wall of the hollow recess being cylindrical (as shown in the figures).

It is also to be noted that the term "at least approximately" is vague and unclear and leaves the reader in doubt as to its exact meaning.

In this report, these amendments (introduction of the features (a) and (b)) are therefore disregarded.

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3. The document D1 discloses:

A heat conduction device for dissipating heat from a heat-generating component (7), the heat conduction device comprising a radiator (3), the radiator having a first surface (*the first fin on the left hand side of figure 2*) and a second surface (*the last fin on the right hand side of figure 2*), the radiator further having a through-hole extending from the first surface to the second surface; and a column body (4) received within the radiator (3) through-hole, the column body (4) having a first end and a second end, the first end having a recess (41) therein that forms a hollow portion to increase the radiating surface and the second end having a contact surface for receiving heat from the heat generating component (7).

Since the features "top surface" and "bottom surface" depend merely on the orientation of the device, the first surface of the radiator can be considered as a top surface, and the second surface as a bottom surface (or vice versa).

The subject-matter of claim 1 (without the features (a) and (b), see point 2 above) is therefore not novel over D1.

4. An independent claim 1 which would have been formulated as such, would have seemed to meet the requirements of the PCT with respect to novelty and inventive step :

A heat conduction device for dissipating heat from a heat-generating component, the heat conduction device comprising a radiator, the radiator having a **first** surface and a **second** surface, the radiator further having a through-hole extending from the **first** surface to the **second** surface; and a column body received within the radiator through-hole, the column body having a first end and a second end, the first end having a recess therein that forms a hollow portion to increase the radiating surface and the second end having a contact surface for receiving heat from the heat generating component, wherein **the distance between the first end and the second end of the column body is at least equal to the distance between the first surface and second surface of the radiator** and wherein the recess is defined by an inner wall that extends in a direction away from

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**the second end and in the direction from the first surface of the radiator to the second surface of the radiator.**

**Re Item VII**

**Certain defects in the international application**

5. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
6. A document (eg. D2) reflecting the prior art described on page 1 (lines 11-19) is not identified in the description (Rule 5.1(a)(ii) PCT).